

BUSHFIRE MANAGEMENT PLAN

FOR

RURAL LAND SHARING COMMUNITIES

LOT 2 DP 582300, LOTS 3, 8, 19, 20, 22, 31, 32,
33, 34 AND 35 DP 755714, LOT 1 DP 390311,
LOTS 1 AND 2 DP 611556, LOT 5 DP 582299, LOT
11 DP 1194471, LOT 4 DP 737440, LOT 121, DP
134446, LOT 11 DP 1194471, LOT 1 DP 1183098,
LOT 2 DP 1148316.

2954 KYOGLE ROAD,

KUNGHER

PREPARED BY

BUSHFIRESAFE

(AUST) PTY LTD

Nov 2020

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EXECUTIVE SUMMARY

Bushfiresafe (Aust) P/L has been engaged by Planit on behalf of their client to undertake a complete Bushfire Risk Assessment for a concept plan for proposed rural land sharing communities at Lot 2 DP 582300, Lots 3, 8, 19, 20, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311, Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot 121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP 1148316, 2954 Kyogle Road, Kungher. The assessment was conducted in accordance with section 4.46 of the Environmental Planning & Assessment Act (1979) and followed the guidelines recommended in the Planning for Bushfire Protection (RFS, 2019) sections 5 "Standards for Bush Fire Protection Measures for Residential and Rural Residential Subdivisions", s6 "Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Developments", 4.3.6(e) "State Environmental Planning Policy No. 15 (Rural Land sharing Communities)" and where required the performance requirements for eco-tourism.

Property Description

The subject property is located to the northern side of Kyogle Road on moderate to steeply sloping land which is heavily vegetated. The subject property is zoned RU2 – Rural Landscape in the Tweed Shire Council Local Environment Plan; a Rural Land Sharing Community development permissible with consent. Kyogle Road adjoins the southern property boundary; a comprehensive ecological survey has been undertaken on the entire properties with areas of high ecological significance identified and mapped, a large area of the property is currently under agreement for Plantation Timber Harvesting some of these plantation areas shall be modified to achieve the recommended asset protection zones where required. The remaining areas not identified as either high ecological value or plantation forest consists of native forest vegetation with small area of grassland scattered throughout.

This development proposal seeks approval for the consolidation of the current 21 titles into 11 Torrens Title Lots and the approval of the concept subdivision plan for 10 Rural Land Sharing Communities which will consist of approximately 392 individual dwelling sites generally consisting of an area of 1ha for each dwelling site.

Vegetation assessment

The vegetation of the subject property and adjacent properties up to 140m (where practicable) from the proposed subdivision was assessed during a site visit on 2nd of October 2019. The vegetation communities present were identified and classified into formations as described in Keith (2004).

The onsite assessment identified vast areas of existing plantation and native forest vegetation in the vicinity of the proposed development areas.

Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to the subject property, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2019).

The proposed future dwelling locations are positioned to take advantage of the existing private road network and generally cleared/clearable areas. As such, these future dwellings and access ways generally follow the ridgelines of the site. All dwelling plots (through site preparation) will be capable of providing a developable envelope to achieve a minimum BAL-

29 for dwellings; therefore it is a recommendation of this report that a 52 metre asset protection zone (APZ) shall be implemented and maintained on all elevations of the individual dwelling sites, the APZ shall consist of a 32 metre Inner Protection Area (IPA) and a 20 metre Outer Protection Area (OPA).

Bush Fire Attack Level

An assessment of the bushfire attack level applicable to the proposed development was carried out using the methodology detailed in Appendix 1 of Planning for Bushfire Protection (RFS, 2019) and Appendix B of AS 3959-2018. The bushfire assessment undertaken in relation to the proposed development concluded:

The asset protection zones for the proposed dwelling locations have been calculated to comply with a BAL-29 bushfire attack category.

Access

The development Concept Plan (Figure 15) illustrates the proposed development access road linking with Kyogle Road in three (3) locations. The road system consists of 3 types of roads Primary roads, secondary roads and informal roads. The primary road links to Kyogle Road in 3 locations at precinct 1 within the eastern portion of the site, precinct 2 within the central portion of the site and precinct 3 within the western portion of the site and linking to the internal secondary road network.

Services

A 20,000L fire fighting water supply must be available to each of the proposed dwelling sites.

It is envisioned that the proposed development shall not be reliant on an electrical network, therefore solar electricity shall be generally utilised throughout the development, however where electrical transmission lines are used these should be underground; where overhead electrical transmission lines are installed, lines should be installed with short pole spacing, unless crossing gullies, gorges or riparian areas. No part of a tree should be closer to a power line than the distance set by the appropriate authority. Regular inspection of lines is required to ensure they are not fouled by branches.

Construction Standards

The bushfire risk management assessment undertaken in relation to the proposed rural land sharing communities concluded that the construction standard in accordance with AS 3959 (2018) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2018) will be assessed and nominated when development applications are submitted for the construction of dwellings.

GLOSSARY

APZ	Asset Protection Zone
BFRMP	Bushfire Risk Management Plan
TSCBPL	Tweed Shire Council Bushfire Prone Lands map
EEC	Endangered Ecological Community
EP&A	Environmental Planning and Assessment Act
IPA	Inner Protection Area
KPoM	Koala Plan of Management
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection manual
PHACS	Primary Habitat and Corridors Strategy
RFS	Rural Fire Service of New South Wales
SEPP	State Environmental Planning Policy
TOBAN	Total Fire Ban
TSC Act	Threatened Species Conservation Act (1995)
TSCA Act	Threatened Species Conservation Amendment Act (2002)

BUSH FIRE RISK MANAGEMENT PLAN

1.0 SCOPE OF THE PLAN

The Bushfire Risk Management Plan (BFRMP) is a strategic document which identifies: the level of bush fire risk for human habitation; strategies which will be implemented to manage the bush fire risk identified; and those persons responsible for implementing and maintaining this Bushfire Risk Management Plan.

1.1 Area

This Plan covers a concept plan for proposed rural land sharing communities at Lot 2 DP 582300, Lots 3, 8, 19, 20, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311, Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot 121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP1148316, 2954 Kyogle Road, Kungher, within Tweed Shire Council Local Government Area; the development will consist of approximately 392 dwelling sites scattered through several locations.

1.2 Period of Operation

Once approved by the Local Authority and the NSW Rural Fire Service, this Plan will have a period of operation of the life of the development.

1.3 Aim and objectives of the Plan

The aim of this Plan is to provide for the mitigation of bush fires for the protection of life and property for the habitants, visitors and emergency personnel in bush fire situations Secondly, the Plan aims to reduce the threat to ecological and environmental assets. To achieve this aim, the Bushfire Risk Management Plan must address a number of specific objectives.

- i. Identify the area most at risk from bush fire attack;
- ii. Reduce the risk of bush fire damage to life and property;
- iii. Ensure that the developer/owner/occupier understands their bush fire management responsibilities;
- iv. Reduce the impact of bush fire on the development;
- v. Develop sustainable Asset Protection Zones (APZ) surrounding the proposed building

1.4 Bushfire Risk Management Strategies

This Plan contains a number of strategies, which are directed at addressing the risk to the development from bushfire emergencies. This is achieved through addressing and managing fuel loads, separation distances from the assessed dominant bushfire vegetation, and

recommending appropriate bushfire building standards.

1.5 Implementation

Implementation of the strategies in this Plan is the responsibility of the developer and shall be undertaken as part of the development infrastructure. The ongoing maintenance of the strategies in this Plan shall be the responsibility of the Nightcap Rural Land Sharing Community management committee. Finally, the local authority or their delegated authority, for the life of the development shall monitor this Plan.

2.0 LEGISLATIVE BUSHFIRE HAZARD MANAGEMENT RESPONSIBILITIES

2.1 Tweed Shire Council

The Tweed Shire Council has responsibility, under Section 66 of the Rural Fires Act, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the Rural Fires Act requires the council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

2.2 New South Wales Rural Fire Service

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. Section 73 of the Rural Fires Act (1997) enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

2.3 NSW Fire Brigade

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation. Through mutual aid agreements, the NSW Fire Brigade can provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Furthermore, Hazmat operations within New South Wales are the responsibility of the NSW Fire Brigade.

2.4 Tweed Shire Council Bush Fire Management Committee

The Tweed Shire Council Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organisation, a fire fighting organisation or a

funding source for fire management activities. The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act (1997).

Section 50 of the Act requires the Bush Fire Co-ordinating Committee to constitute a Bush Fire Management Committee for the whole of the area of any local Council area for which a rural fire district is constituted.

Section 51(1A) requires a Bush Fire Management Committee to report to the Bush Fire Coordinating Committee on the implementation of the requirements of the Bushfire Risk Management Plan.

Section 52 requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.

Section 54 of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

2.5 Private Land Owners / Occupiers

The Rural Fires Act, 1997 provides several legislative opportunities to require land owners and occupiers to manage hazardous fuels. These are listed below:

Section 63(2) states that 'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'. In this section; 'notified steps' means any steps that:

- (a) a bushfire risk management plan (or the Co-ordinating Committee) advises a person to take;
- (b) are included in a bush fire risk management plan that applies to that land.

Section 87 allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding total fire ban (TOBAN) days. Section 10 permits are not required to adhere to Part V provisions of the Environmental Planning & Assessment Act (1979) (EP&A Act) in any assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (see Section 100E of the Rural Fires Act (1997)).

3.0 INTRODUCTION

Development applications on bush fire prone land must be accompanied by a bush fire assessment report that demonstrates compliance with the aim and objectives of the Planning for Bushfire Protection (PBP) guidelines. In particular, the following matters must be addressed:

- a) A statement that the site is bush fire prone land, where applicable;
- b) The location, extent and vegetation formation of any bushland on or within 100m of the site;

- c) The slope and aspect of the site and of any bush fire prone land within 100m of the site, which may determine the likely path of any bush fire;
- d) Any features on or adjoining the site that may mitigate the impact of a high intensity bush fire on the proposed development;
- e) A statement of the likely environmental impact of any proposed bush fire protection measures; and
- f) Whether any building complies with AS 3959/1999 in relation to the construction level for bush fire protection.

3.1 Background

Bushfiresafe (Aust) P/L has been engaged by Planit on behalf of their client to undertake a complete Bushfire Risk Assessment for a concept plan for proposed rural land sharing communities at Lot 2 DP 582300, Lots 3, 8, 19 20,, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311, Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot 121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP 1148316, 2954 Kyogle Road, Kungher. The assessment was conducted in accordance with section 4.46 of the Environmental Planning & Assessment Act (1979) and followed the guidelines recommended in the Planning for Bushfire Protection (RFS, 2019) sections 5 “Standards for Bush Fire Protection Measures for Residential and Rural Residential Subdivisions”, s6 “Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Developments”, 4.3.6(e) “State Environmental Planning Policy No. 15 (Rural Land sharing Communities)” and where required the performance requirements for eco-tourism.

The assessment has involved the following activities:

- i. Verifying of terrain attributes in relation to the assessed bushfire vegetation.
- ii. Identification of the appropriate bushfire protection for any identified environmental assets.
- iii. Determination of the location of adequate water supplies for fire fighting purposes.
- iv. Identifying the capacity of public roads to handle increased volumes of traffic in a bushfire situation.
- v. Identification of adequacies for implementation of fire trails which link to Public roads in the vicinity.
- vi. Identification of adequacy of arrangements for access and egress from the development for the purposes of an emergency response.
- vii. Identification of construction standards to be used for building elements in the development.
- viii. Identification of adequacy of bushfire maintenance plans and fire emergency procedures for the development.

- ix. Identification of additional bushfire protection measures.

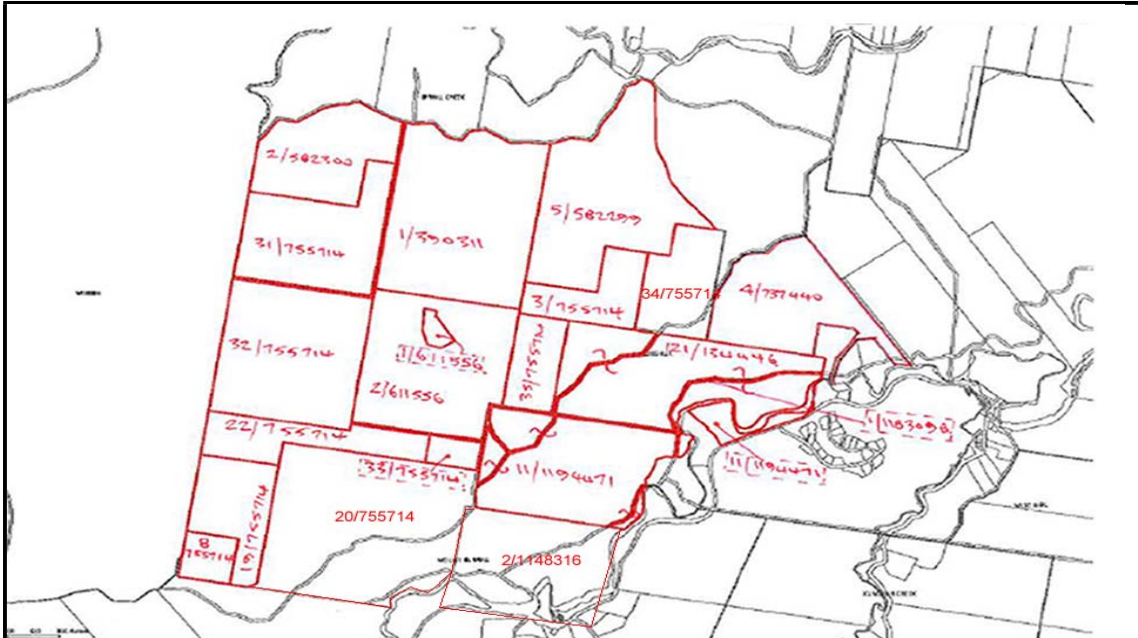


Figure 1: Shows the properties involved which will be known as the subject property throughout the report.

3.2 Description of property

The subject property is located to the northern side of Kyogle Road on moderate to steeply sloping land which is heavily vegetated. The subject property is zoned RU2 – Rural Landscape in the Tweed Shire Council Local Environment Plan; Rural Land Sharing Communities development permissible with consent. Kyogle Road adjoins the southern property boundary; a comprehensive ecological survey has been undertaken on the entire properties with areas of high ecological significance identified and mapped, a large area of the property is currently under agreement for Plantation Timber Harvesting some of these plantation areas shall be modified to achieve the recommended asset protection zones where required. The remaining areas not identified as either high ecological value or plantation forest consists of native forest vegetation with small area of grassland scattered throughout.

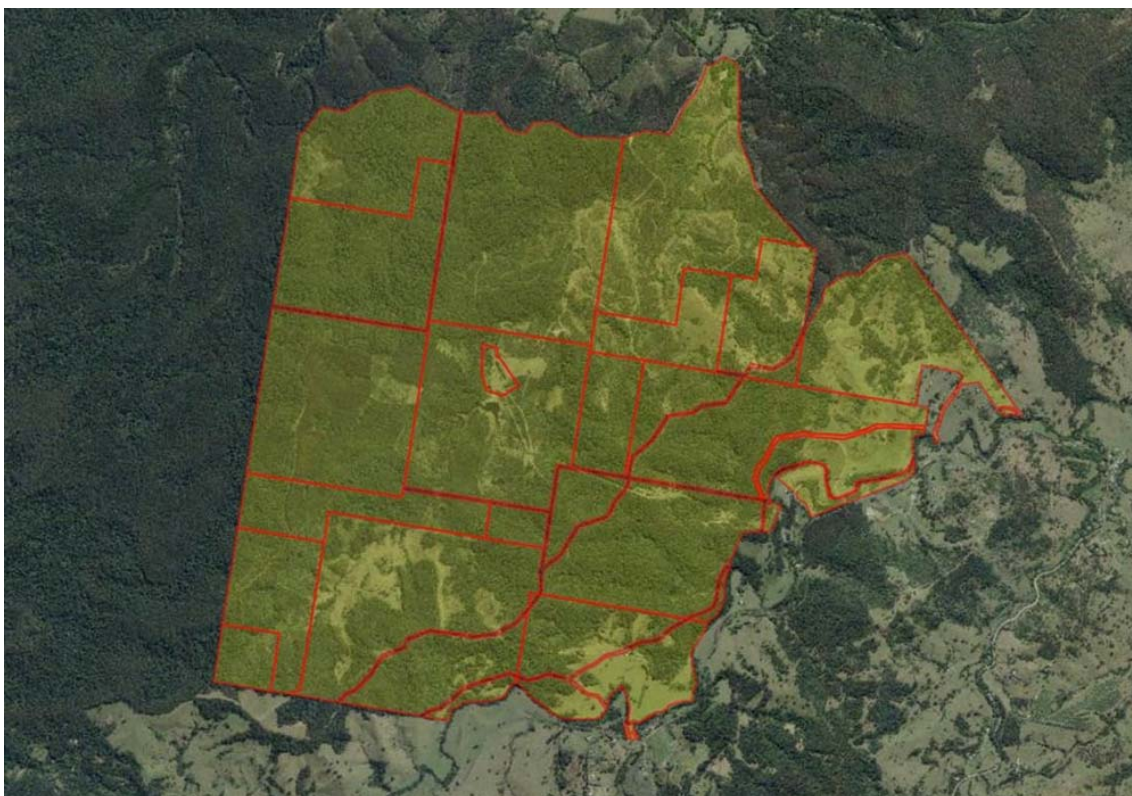


Figure 2: Aerial photograph showing subject property in relation to the vegetation within the subject property.

3.3 Proposal

This development proposal seeks approval for the consolidation of the current 21 titles “Lot 2 DP 582300, Lots 3, 8, 19, 20, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311, Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot 121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP1148316”, 2954 Kyogle Road, Kunghur within Tweed Shire Council Local Government Area; into 11 Lots and the concept subdivision plan for Rural Land Sharing Communities which will consist of approximately 392 individual dwelling sites consisting of an area of 1ha for each dwelling site. The development has been divided into three (3) precincts for the ease of assessing the development; precinct 1 is located in the eastern portion of the site and consists of 24 allotments/dwelling sites, precinct 2 is located within the central portion of the development property and comprises 183 allotments/dwelling sites; precinct 3 is located within the western portion of the development property and comprises 186 allotments/dwelling sites.

3.4 NSW Rural Fire District BFRMP

The Tweed Shire Council's Bushfire Management Options are to:

(a) **Reduce the hazard** - encourages the development of asset protection zones along the settlement area - bushland interface.

(b) **Reduce vulnerability** - maintain development and building controls and standards appropriate to the level of hazard.

4.0 VEGETATION CLASSIFICATION

The vegetation of the subject property and adjacent properties up to 140m (where practicable) from the proposed subdivision was assessed during a site visit on 2nd of October 2019. The vegetation communities present were identified and classified into formations as described in Keith (2004).

Planning for Bushfire Protection (PBP) manual (RFS, 2019) outlines the methodology for determining the predominant bushfire prone vegetation to the distance of at least 140 metres in all directions from the future development on the site. Vegetation is classified using Table A1.2 of *Planning for Bushfire Protection* 2019, which classifies vegetation types into the following groups:

- | | |
|---|-----------------------------------|
| (a) <i>Forests [wet & dry sclerophyll forests];</i> | (g) <i>Freshwater Wetlands;</i> |
| (b) <i>Woodlands;</i> | (h) <i>Saline Wetlands</i> |
| (c) <i>Plantations – being pine plantations but not native plantations;</i> | (i) <i>Alpine Complex;</i> |
| (d) <i>Forested Wetlands;</i> | (j) <i>Semi – arid Woodlands;</i> |
| (e) <i>Tall Heath lands;</i> | (k) <i>Arid Woodlands; and</i> |
| (f) <i>Short Heath lands;</i> | (l) <i>Rainforests</i> |

4.1 Vegetation communities present within 140m of the Development Sites

There are vast areas of existing plantation which can be selectively removed and managed to reduce the overall hazard of the development. APZ's based on vegetation community typology, slope and Flame Danger Index (FDI) have been considered at this preliminary stage. Additional specifics and compliance (such as dwelling plots, distance to vegetation, etc) will form latter DA stages. As such, this preliminary response sets out the proposed methodology of the concept development and provides the guidelines for future detailed DA stages.



Figure 3: Top: View to the west of the Lookout Trail showing an area of plantation Forest vegetation which shall be modified to accommodate building site and asset protection zones: Below: View to the east of the Lookout Trail showing an area of plantation Forest vegetation which shall be modified to accommodate building site and asset protection zones (Photographs, W. Hadaway)



Figure 4: Top: View of a large clearing currently used for Outward Bound Rope Courses surrounded by open forest vegetation occurring on a 15-18° down slope: Below: View to the west of the Outward Bound Trail showing an area of plantation Forest vegetation occurring on an upslope terrain which shall be modified to accommodate building site and asset protection zones (Photographs, W. Hadaway)



Figure 5: Top: View to the west of the Power Easement Trail within the southern portion of Precinct 2 showing an area of Forest vegetation which shall be modified to accommodate building site and asset protection zones: Below: View to the east of the Power Easement Trail within the southern portion of Precinct 2 showing an area of Forest vegetation occurring on undulating terrain which shall be modified to accommodate building site and asset protection zones (Photographs, W. Hadaway)



Figure 6: Top: View of a large clearing located at the end of the amphitheatre trail surrounded by plantation forest vegetation occurring on an varying terrain: Below: View to the along the Amphitheatre Trail showing an area of plantation Forest vegetation occurring on an upslope terrain which shall be modified to accommodate building site and asset protection zones (Photographs, W. Hadaway)



Figure 7: View of the area proposed for the future Amphitheatre showing plantation forest vegetation occurring on an upslope terrain which shall be modified to accommodate an asset protection zone, native grassland and weeds occurs on the remaining elevations (Photographs, W. Hadaway)



Figure 8: Top: View of a large clearing located within precinct 1 surrounded by forest vegetation occurring on a varying terrain: Below: View of a large clearing located within precinct 1 surrounded by forest vegetation occurring on an varying terrain (Photographs, W. Hadaway)



Figure 9: Top: View within the southern portion of Precinct 3 showing native grassland followed by forest vegetation occurring on an upslope terrain: Below: View within the southern portion of Precinct 3 showing native grassland along creek flats followed by forest vegetation occurring on an upslope terrain beyond an east-west flowing creek (Photographs, W. Hadaway)



Figure 10: Top: View of a large clearing located within the lower section within the southern portion of Precinct 3 surrounded by forest vegetation occurring on an upslope terrain: Below: View of a large clearing located within the central section within the southern portion of Precinct 3 surrounded by forest vegetation occurring on varying terrain (Photographs, W. Hadaway)

4.2 Assessed Bushfire Vegetation in Relation to the Proposed Subdivision

The area of the property has been assessed as containing Category 1 bushfire prone vegetation, according to the Tweed Shire Council Bushfire Prone Lands (TSCBPL) map. The onsite assessment concluded that forest vegetation occurs within the development property within 140 metres of each developable precinct.

It was assessed that the forest vegetation will have the most influence on bushfire behaviour for this development.

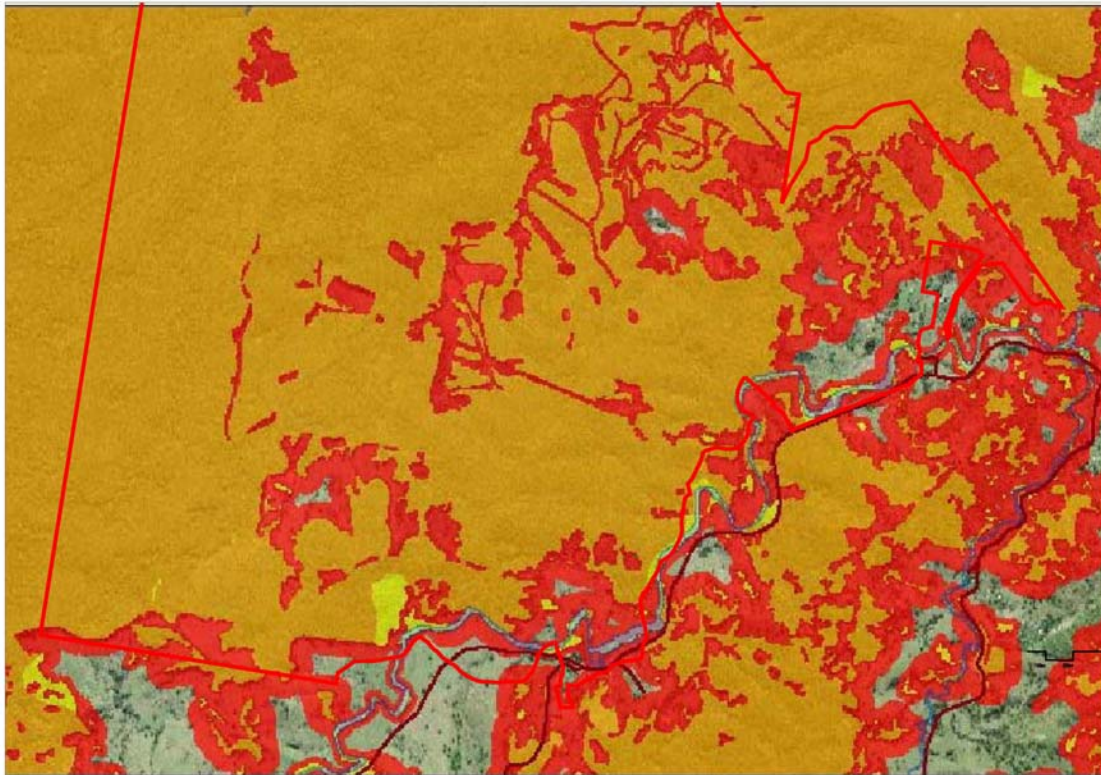


Figure 11: Tweed Shire Council bushfire prone land map showing subject property in relation to the identified bushfire prone vegetation.

5.0 Assessed Dominant Slope in relation to identified bushfire prone vegetation

Planning for Bushfire Protection (RFS, 2019) recommends that slopes should be assessed, over a distance of at least 100m from a development site and that the dominant gradient of the land should be determined on the basis of which will most significantly influence the fire behaviour at the site.

The terrain within the subject property consists of moderate to steep slopes with varying aspects, most of the dwelling sites being within 100 metres from slopes between 15 to 18° down slope with the associated 52 metre asset protection zones (APZ) implemented on slopes not greater than 18°.

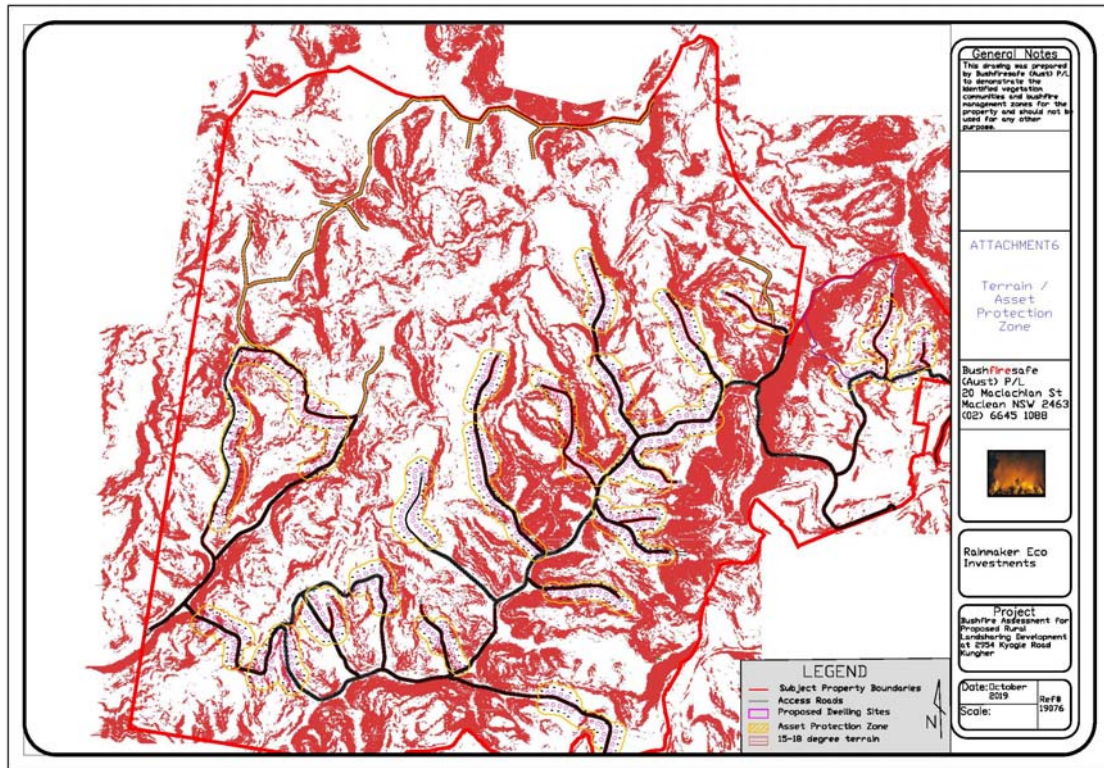


Figure 12: Map depicting land with slopes between 15-18°.

6.0 BUSHFIRE ASSESSMENT FOR PROPOSED DEVELOPMENT

6.1 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to the subject property, and in accordance with Appendix 1 Table A1.12.6, Planning for Bushfire Protection (RFS 2019).

The proposed future dwelling locations are positioned to take advantage of the existing private road network and generally cleared/clearable areas. As such, these future dwellings and access ways generally follow the ridgelines of the site. All dwelling plots (through site preparation) will be capable of providing a developable envelope to achieve a minimum BAL-29 for dwellings; therefore it is a recommendation of this report that a 52 metre asset protection zone (APZ) shall be implemented and maintained on all elevations of the individual dwelling sites, the APZ shall consist of a 35 metre Inner Protection Area (IPA) and a 17 metre Outer Protection Area (OPA).

The 52 metre APZ has been applied to each dwelling site, however this may be able to be reduced as site specific plots are checked through final surveys completed for individual site.

Note: It is highly likely that an amphitheatre and several community buildings will form part of the development application for precinct 3. The amphitheatre and community buildings will

be used for meetings of the Rural Land Sharing Communities and functions, therefore there is a possibility of large numbers of people using these buildings at any one time, these building shall be utilised as a safe refuge building. At the DA stage for the individual precincts the asset protection zones for the amphitheatre and community buildings shall be calculated using the method 2 calculations in Australian Standard AS3959-2018 (Construction of Buildings in Bushfire Prone Areas) to achieve a bushfire attack level of less than 10kW/m² using flame temperature of 1200K.

The Asset Protection Zones for all aspects of the development shall be measured from the foliage drip line and shall be implemented and maintained to the specifications as outlined below.

Inner Protection Area (IPA) shall be maintained in such a manner that;

- minimal fire fuel that could be set alight by bushfire (e.g. long grass, tree branches etc.) is present at ground level;
- vegetation does not provide a path for the transfer of fire to the development;
- trees are a minimum of 5 metres away from any building, measured from the edge of the foliage to the roof line or any open balconies;
- bark chips and the like are not present within 5 metres of any building;
- any trees present have a minimum canopy separation of 2 metres; and
- any trees present are not species that retain dead material or deposit excessive amounts of ground fuel in a short time.

An Outer Protection Area (OPA) serves to reduce the potential length of flames by slowing the rate of spread of a fire, filtering embers and reducing the likelihood of crown fires. This zone may be reduced with a corresponding increase in the IPA. Where the vegetation type comprises heath communities, rainforests and woodlands, it is not possible to distinguish between an IPA and an OPA, and hence all such APZs should be managed as an IPA. However, where an OPA can be established, it should comprise:

- a tree canopy cover of less than 30%;
- a managed understorey (lawn); and
- shrubs that have been pruned prior to the commencement of the fire season.

6.1.1 Dwelling Sites

Dwellings will be situated in clusters, located in 'developable areas' along existing roads identified over the site as per Attachment 1 - 3. These developable areas have been mapped in consideration of the site constraints and generally form areas that:

- Have 18° or less of slope;
- Comprise grassland areas and/or plantation regrowth areas for suitable vegetation clearing and management of APZ's
- Located outside key ecological linkages, corridors and vegetation areas;
- Are suitably accessed by internal road network; and
- Are free from other environmental constraints such as flooding, acid sulphate soils, etc.

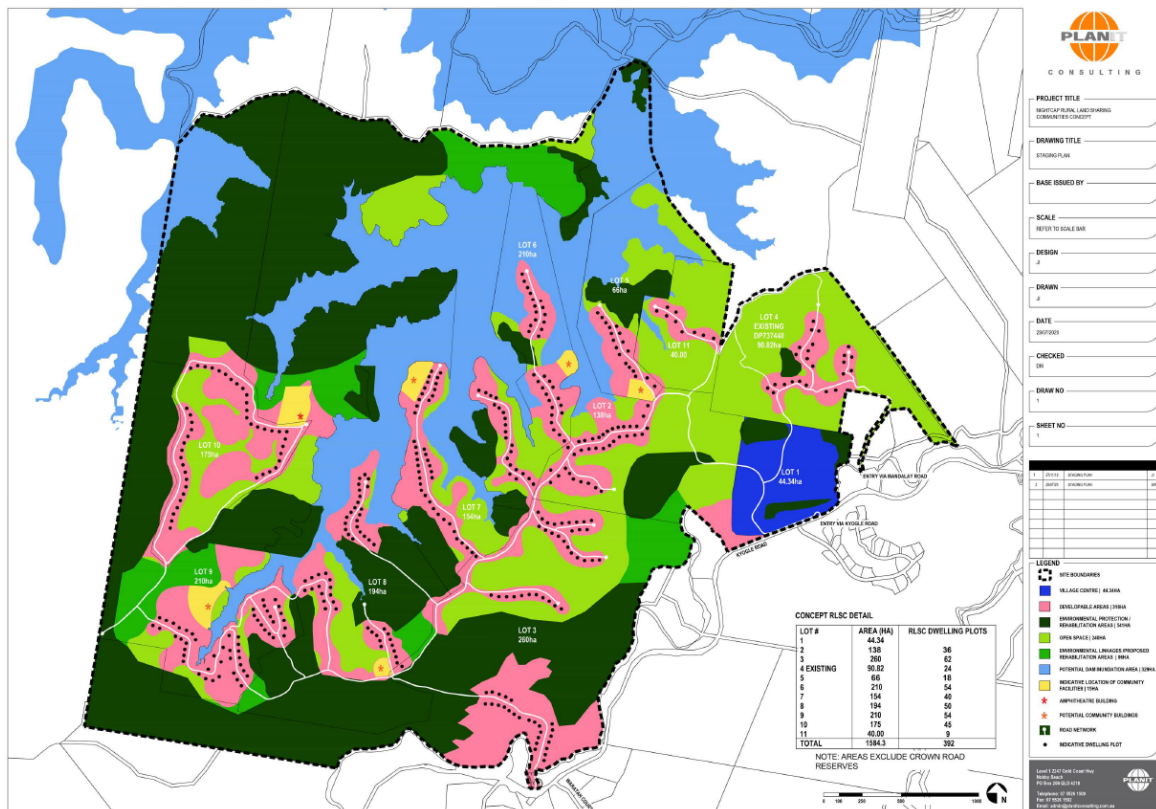


Figure 13: showing developable areas of the proposed development & Plantation areas that can be cleared/modified to create asset protection zones and environmental protection areas.

6.2 Assessed Bushfire Attack Level

An assessment of the bushfire attack level applicable to the proposed development was carried out using the methodology detailed in Planning for Bushfire Protection (RFS, 2019) and Appendix B of AS 3959-2018. The bushfire assessment undertaken in relation to the proposed development concluded:

The asset protection zones for the proposed dwelling locations have been calculated to comply with a BAL-29 bushfire attack category using the following parameters:

- The property is in a FDI 80 region
- Forest vegetation as the dominant bushfire prone vegetation impacting all sites;
- 15-18° down slope influencing bushfire behaviour;
- 52m APZ separating any forest vegetation from the proposed dwelling sites;

The safe refuge building/s within the development that are located adjacent to bushfire prone vegetation which shall have adequate asset protection zones applied to maintain a minimum BAL-12.5 bushfire attack level and have been situated to achieve radiant heat levels less than 10kW/m².

6.3 Adequacy of Water Supply

A 20,000L firefighting water supply must be available to the proposed dwelling sites. The firefighting water supply shall meet the following requirements.

- a) A hardened ground surface for firefighting truck access is to be constructed up to and within 4 metres of the firefighting water supply.
- b) A 65mm metal Storz outlet with a gate or ball valve, shall be fitted to any firefighting water supply tank(s) and be accessible for a fire fighting truck. The Storz outlet fitting shall not be located facing the hazard or the approved structure.
- c) The gate or ball valve, pipes and tank penetration are adequate for full 50mm inner diameter water flow through the Storz fitting and are constructed of a metal material.
- d) All associated fittings to the firefighting water supply tank(s) shall be non-combustible.
- e) All water supplies for firefighting purposes shall be clearly signposted as a fire fighting water supply.
- f) Firefighting water supply tank(s) and associated fittings, located within 60 metres of a bushfire hazard and on the hazard side of an approved building, shall be provided with radiant heat shielding to protect the tank from bush fire impacts and maintain safe access to the water supply for fire fighters.

6.4 Electricity Supply for the proposed Development

Electrical supply is currently available to the development through existing overhead power easement that currently traverses the property at various locations.

6.5 Adequacy of Access and Egress in Bushfire Situations

The development Concept Plan (Attachment 1) illustrates the proposed development access road linking with Kyogle Road in three (3) locations. The road system consists of 3 types of roads Primary roads, secondary roads and informal roads. The primary road links to Kyogle

Road in 3 locations at precinct 1 within the eastern portion of the site, precinct 2 within the central portion of the site and precinct 3 within the western portion of the site and linking to the internal secondary road network, The primary road shall be constructed in accordance Planning for Bushfire Protection 2019 section 6.8.2 as outlined below. The secondary roads provide access to the individual house sites and link to the primary road in various locations, the secondary roads shall comply with section 5.3.2. The informal roads provide alternative emergency access and egress linking to some secondary roads, the existing informal roads shall where practicable be maintained in accordance with the NSW Rural Fire Service's document "Fire Trail Standards.

S6.8.2 Access

- (a) Access roads are two-wheel drive, all weather roads;
- (b) Roads are provided with at least two traffic lane widths (carriageway 8 metres minimum) and shoulders each side, allowing traffic to pass in opposite directions;
- (c) Roads should be through roads. Dead end roads are not recommended, but if unavoidable, dead ends should not be more than 100m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead end;
- (d) The capacity of road surfaces and bridges should be sufficient to carry fully loaded fire-fighting vehicles (15 tonnes);
- (e) Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape;
- (f) The minimum distance between inner and outer curves should be 6m;
- (g) Maximum grades should not exceed 15° and preferably not more than 10° or gradient specified by road design standards, whichever is the lesser gradient;
- (h) A minimum vertical clearance of 4 metres to any overhanging obstructions including tree branches;
- (i) Roads should not traverse a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
- (j) Roads should be clearly sign-posted and bridges should clearly indicate load rating;

S5.3.2 Access

- (a) Access roads are two-wheel drive, all weather roads;
- (b) Roads should be through roads. Dead end roads are not recommended, but if unavoidable, dead ends should not be more than 200m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead end;
- (c) A passing bay every 200 metres which shall be 20 metres long by three (3) wide, making a minimum trafficable width of seven (7) metres at the passing bays;
- (d) The capacity of road surfaces and bridges should be sufficient to carry fully loaded fire-fighting vehicles (approximately 27 tonnes or 9 tonnes per axle);
- (e) Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape;
- (f) The minimum distance between inner and outer curves should be 6m;
- (g) Maximum grades should not exceed 15° and preferably not more than 10° or gradient specified by road design standards, whichever is the lesser gradient;
- (h) There must be a minimum vertical clearance of 4 metres above the road at all times;
- (i) Roads should not traverse a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
- (j) Roads should be clearly sign-posted (with easily distinguished names) and buildings should be clearly numbered. Bridges should clearly indicate load rating;
- (k) a reversing bay may be provided in lieu of a loop road around the dwelling and refuge buildings or a turning circle. Where a reversing bay is provided it shall be not less than 6 metres wide and 8 metres deep with an inner minimum turning radius of 6 metres and outer minimum radius of 12 metres



Figure 14: Top: Current access to Precinct 2 linking to Kyogle Road: Below: Current access to Precinct 1 linking to Mandalay Road (Photographs, W. Hadaway)

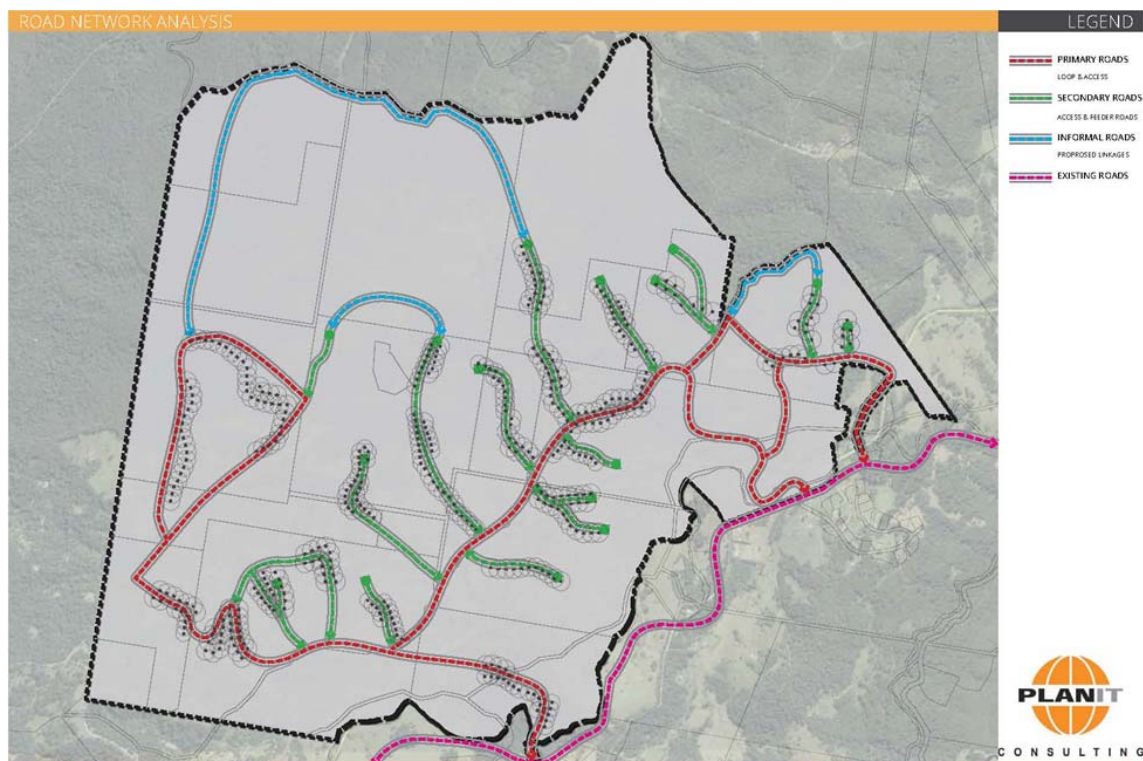


Figure 15: Current road hierarchy as prepared by Planit Consulting

Note: Further investigation shall be carried out prior to any development application for the construction of dwellings to identify additional locations of informal link roads.

7.0 BUSHFIRE CONSTRUCTION STANDARDS

The bushfire risk management assessment undertaken in relation to the proposed rural land sharing community concluded that the construction standard in accordance with AS 3959 (2018) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2018) will be assessed and nominated when development applications are submitted for the construction of dwellings.

8.0 LANDSCAPING AND PROPERTY MAINTENANCE – BUSHFIRE PROVISIONS

According to the PBP manual, the principles of landscaping for bush fire protection are to: prevent flame impingement on the dwelling; provide a defensible space for property protection; reduce fire spread; deflect and filter embers; provide shelter from radiant heat; and reduce wind speed. Careful consideration of the species selection, their location relative to their flammability, and on-going maintenance to readily remove flammable fuels (leaf litter, twigs and debris) is critical to providing for bushfire protection (RFS, 2019).

REFERENCES

Tweed Shire Council, 2014 Tweed Shire Council Bushfire Prone Lands Map.

Tweed Shire Council, 2014. Tweed Shire Council Local Environment Plan.

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RFS, 2019. *Planning for Bushfire Protection, New South Wales Rural Fire Service*. NSW, Sydney.

Standards Australia, 2018. *Australian Standard 3959-2018 Construction of Buildings in Bushfire-prone Areas*. Standards Australia, Sydney.

COMMERCIAL IN CONFIDENCE

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All information in this document is provided in strict commercial confidence. It shall not be disclosed to any third party without the express written consent of Bushfiresafe (Aust) Pty Ltd.

Appendix 1 – Bushfire Design Brief

The following Bushfire Design Brief (BDB) provides a summary of the process of the analysis undertaken to formulate the performance solution for the property access.

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Bushfire Design Brief

Proposed Development:

Amalgamation of 21 Lots into 10

Proposed Rural Land Sharing Community- 392 Residential Sites

**Lot 2 DP 582300, Lots 3, 8, 19, 20, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311,
Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot
121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP1148316,
2954 Kyogle Road, Kungher**

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1. Introduction

Pursuant to the requirements of Planning for Bushfire Protection (PBP) 2019, it is recognised a Bushfire Design Brief (BDB) in relation to a development on the subject property under s100B Rural Fire Act (1997) is required in order to demonstrate compliance using performance based approach in relation to access requirements which deviate from the acceptable solutions presented in s5.3.2 and s6.8.2 PBP (2019). For this reason, the client sought Pre-DA Advice from the RFS prior to completing all documentation and submission of the DA to Council.

The information contained herein has been prepared on behalf of the client/s in relation to the following properties:

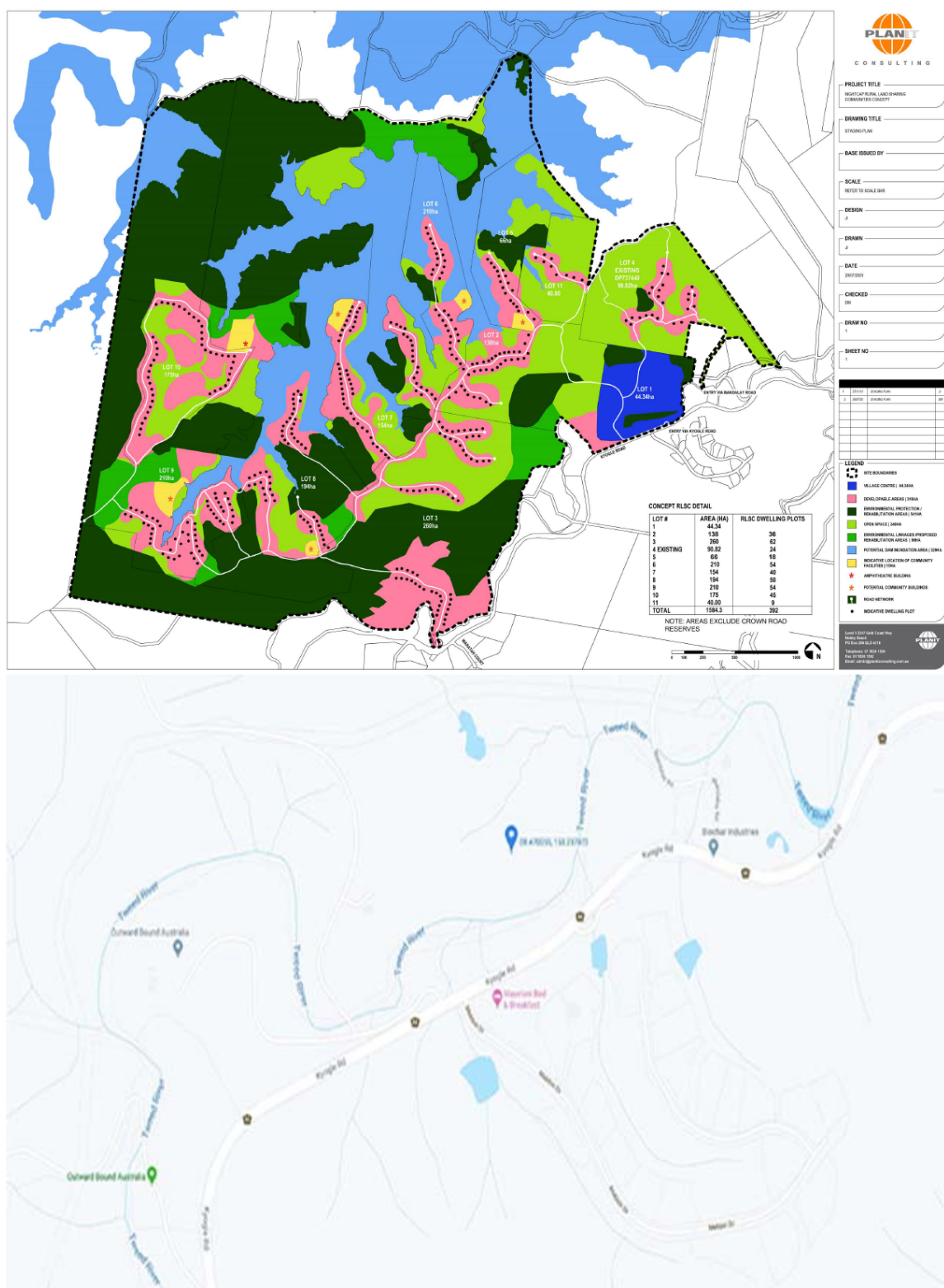
Lot 2 DP 582300, Lots 3, 8, 19, 20, 22, 31, 32, 33, 34 and 35 DP 755714, Lot 1 DP 390311, Lots 1 and 2 DP 611556, Lot 5 DP 582299, Lot 11 DP 1194471, Lot 4 DP 737440, Lot 121, DP 134446, Lot 11 DP 1194471, Lot 1 DP 1183098, Lot 2 DP1148316, 2954 Kyogle Road, Kungher.

The proposed development on the subject property is for the following:

Amalgamation of 21 Lots into 9 Proposed Rural Land Sharing Communities-
392 Residential Sites.

The subject property was inspected on;

2nd October, 25th & 26th November 2019 by Wayne Hadaway Bushfiresafe (Aust) Pty Ltd



2. Bushfire Design Brief

The following Bushfire Design Brief (BDB) summarises the process of the analysis undertaken to formulate an alternative solution regarding the access requirement as proposed for discussion with the NSW Rural Fire Service-Customer Service Centre.

2.1 Scope of the Development

The BDB has been prepared specifically to address the alternative solution in order to demonstrate compliance against the performance criteria for determining the access requirements in relation to the performance criteria of s5.3.2 (Access for Residential Purposes) and s6.8.2 (Access for Special Fire Protection Developments) in relation to the proposed Rural Land Sharing Communities plan presented in herein as Appendix 1.

2.2 Description of the Subject Property

The majority of the bushfire hazard within the subject property consists of dry sclerophyll forest with pockets of rainforest vegetation and large areas of the property is currently under agreement for Plantation Timber Harvesting some of these plantation areas shall be modified to achieve the recommended asset protection zones where required. The remaining areas not identified as either high ecological value or plantation forest consists of native forest vegetation with small area of grassland scattered throughout.

The proposed road system within the rural land sharing communities consists of 3 types of roads, Primary roads, secondary roads and informal roads. The primary road links to Kyogle Road in 3 locations at precinct 1 within the eastern portion of the site, precinct 2 within the central portion of the site and precinct 3 within the western portion of the site and shall be constructed in accordance Planning for Bushfire Protection 2019 section 6.8.2, 17 internal roads provide access to the dwelling sites most of which are dead ends which link to the primary road these roads shall be constructed in accordance Planning for Bushfire Protection 2019 section 5.3.2, the informal roads provide alternative emergency access and egress linking to some secondary roads where possible.

The secondary emergency access roads traverses through forest vegetation which presents the highest risk as the likely direction of bushfire attack would be from the forest hazard north and west of the proposed house sites.

Based on the bushfire threat and likely direction of bushfire attack presents a problem in relation to providing a second access route towards the north and/or west as it has

the potential to place occupants at greater risk should they traverse towards the north and/or the west.

To resolve this issue, it is considered prudent to ensure the proposed access roads traverse through the lower risk land to the south and/or east.

Council Maintained Road	Risk Level
Precinct 1 distance from Mandalay Road (furthest dwelling site) approx. 1000m	• Via low threat vegetation to the east through grassland vegetation. • Lower bushfire risk
Precinct 2 distance from Kyogle Road (furthest dwelling site) approx. 3000m	• Via forest vegetation to the south/east. • Lower bushfire risk
Precinct 3 distance from Kyogle Road (furthest dwelling site) approx. 3000m	• Via fragmented forest vegetation to the south/east. • Lower bushfire risk

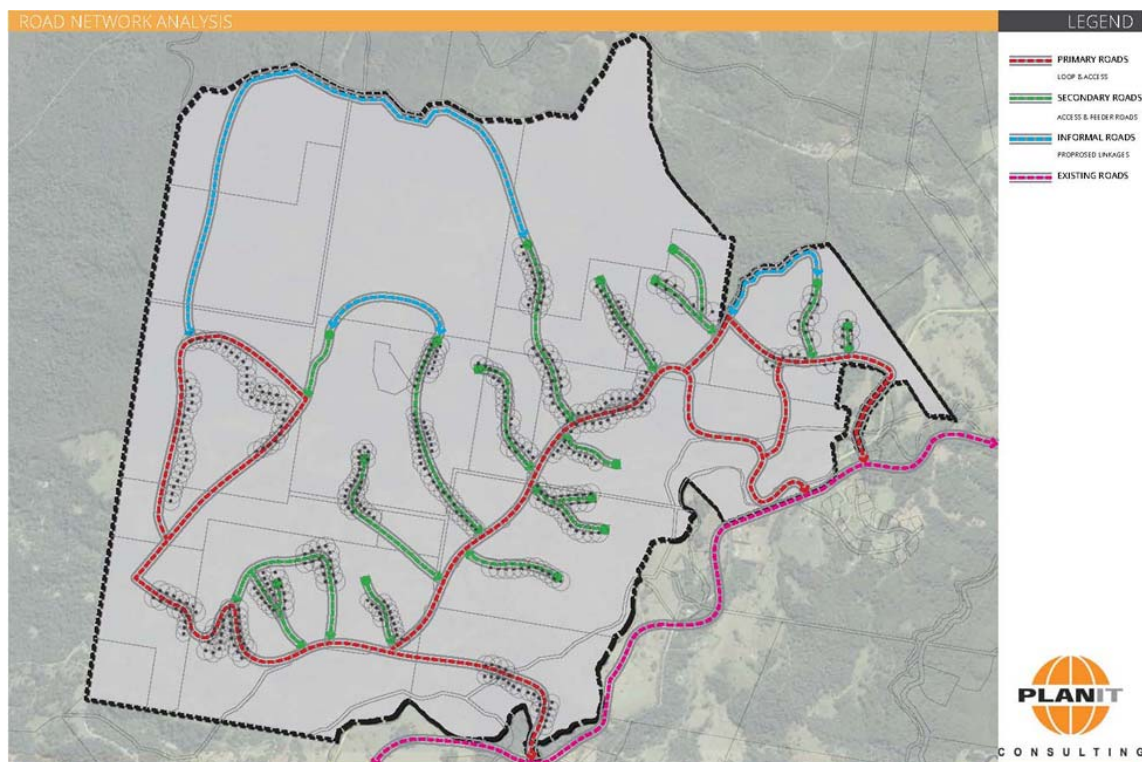


FIGURE 2: SHOWING ROAD ANALYSIS

3. Bushfire Protection Measures for Residential and Rural Residential Subdivisions

3.1 Specific Objectives (PBP s5.2)

- minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);
- minimise vegetated corridors that permit the passage of bush fire towards buildings;
- provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;
- ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;
- ensure the ongoing maintenance of APZs;
- provide adequate access from all properties to the wider road network for residents and emergency services;
- provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and
- ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.

3.2 Intent of Measures – Non Perimeter Roads

- Non-perimeter roads are the interconnecting roads between the perimeter roads and the existing and/or broader road network. These roads form a link for firefighting operations by providing access for emergency vehicles, a safe space for conducting property protection, and a suitable road network for egress of residents.

3.3 Intent of Measures – Property Access Roads

- Property access is any access from private land onto the public road system. In rural areas, in particular isolated rural properties, operational difficulties can be experienced in accessing buildings. Examples include water crossings and roads which may be cut off by fire or other hazardous conditions. As a result, the location and standards of property access roads should be carefully considered.

The intent of measures may be achieved by complying with the acceptable solutions which in turn satisfies the performance criteria. Where an acceptable solution can not be achieved compliance can be achieved by meeting the performance criteria. The performance criteria and acceptable solutions for s5.3.2 and s6.8.2 – Access (PBP 2019) that can't be achieved are outlined below with a description of how compliance can be achieved.

Property Access _ Non-Compliance		
Performance Criteria	Acceptable Solutions	Alternate Solution & Justification
		The following aims to present solutions which meet the criteria & comply with the intent measures
Access to the dwelling sites is provided in recognition of the risk to firefighters and/or evacuating occupants	At least one alternative property access road is provided for individual dwelling or groups of dwellings that are located greater than 200m from a public through road.	• A second access road shall be provided where possible as part of the community land; • All dwellings shall be located in close proximity to the access roads providing additional protection using the identified 52m APZs; • The implementation and ongoing maintenance of the alternate access roads shall be the responsibility of the Rural Land Sharing Community management committee.
Property Access_ Compliance with the Acceptable Solutions		
Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	• minimum 5.5m carriageway width kerb to kerb; parking is provided outside of the carriageway width; • roads are through roads, and these are linked to the internal road system; • curves of roads have a minimum inner radius of 6m; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	
Internal access-firefighting vehicles can access the dwelling and exit the property safely.	• minimum 4m carriageway width; • in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; • provide a suitable turning area in accordance with Appendix	

	3; • curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; • the minimum distance between inner and outer curves is 6m; • the crossfall is not more than 10 degrees; • maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • a development comprising more than three dwellings has access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.
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4. Conclusion

The proposed internal access roads have been designed to provide the greater level of protection that is possible for the development due to the existing site constraints and the potential direction of the bushfire threat. The solution proposed within the BDB aims to provide a greater level of safety for the proposed dwelling sites across the entire subject property.

Provided the Bushfire Protection Measures and the recommendations within the BDB are applied, the solutions demonstrate the access requirements appropriate to the proposed development in light of the existing site constraints.

Appendix 2: Guidelines for Asset Protection Zones